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A stratified random sample of 84 student teachers in secondary school academic subject areas was distributed into four treatment groups according to a trichotomization of their scores on the Minnesota Teacher Attitude Inventory (MTAI). Each student teacher taught two 20-minute lessons with the same content to different classes of five pupils. On group supervised itself using videotape and Flanders' system of interaction analysis; another group was supervised in a more traditional manner (supervisor present). The two remaining groups experienced both self-supervision and teacher supervision. Upon program completion the MTAI was retaken (in one group retesting was at delayed intervals). Analysis of variance indicated the following: (1) No significant relationship exists between attitudes and teaching behavior before supervisory treatment. (2) Supervisory treatment tends to promote a significant relationship between attitudes and teaching behavior. (3) Self-supervision tends to promote indirect teaching and higher MTAI scores. (4) Estimated by student teachers of the precentage of indirect teaching they exhibit in their lessons are very inaccurate under both traditional and self-supervision. (5) No significant relationship exists between time and attitude change in student teachers supervised in a traditional manner. (Author/LP)

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Final Report

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Selected Aspects of Self-Supervision by Student Teachers

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Memphis, Tennessee

June 15, 1968

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I. Summary

Objectives

This study compared instances of self-supervision by student teachers (in which they apply the Flanders system of interaction analysis to their own teaching behavior recorded on video-tape) with instances of supervision of student teachers in a more traditional manner. An analysis was made of the following relationships: 1. certain attitudes of student teachers to the kind of interaction behavior they demonstrate, 2. self-supervision to change in interaction behavior, 3. self-supervision to change in certain attitudes of student teachers, and 4. percentages of certain kinds of interaction behavior found through use of the Flanders system to student teachers' estimates of such percentages.

Methods

A stratified random sample of eighty-four undergraduate secondary school student teachers in academic subjects was divided into four treatment groups according to a trichotomization of their scores on the Minnesota Teacher Attitude Inventory. Each student teacher taught two lessons, with the same content but to different pupils, in the sequence represented on the following chart on which lessons appear as "SS" (self-supervised on video tape) and "TS" (traditionally supervised, i.e., not taped--supervisor analyzes interaction and presents findings during conference); each student teacher gave an estimate of the percentage of indirect control in his lesson after he taught it.

	Fall 1967		Spring 1968	
	Group 1	Group 2	Group 3	Group 4
Twelve	SS	TS	SS	TS
Weeks	SS	TS	TS	SS
	N = 20	N = 20	N = 22	N = 22

Participating student teachers completed the MTAI again at the end of the twelve weeks. Student teachers in Group 2 completed the MTAI an additional time after thirty weeks to provide information about the effect of time on their scores.

Data was analyzed for relationships between MTAI scores and interaction behavior on the first lesson taught, for changes in the incidence of indirect behavior in both lessons by student teachers, for the relationship between observed amounts of indirect control and student teacher estimates of such amounts; and for changes in MTAI scores. Analysis of variance and covariance models were used for group and sub-group comparisons.

Conclusions

The conclusions below are drawn with respect to the methods of traditional and self-supervision which were studied with secondary student teachers teaching academic subjects; indirect teaching was determined by the Flanders system of interaction analysis.

1. No significant relationship exists between attitudes and teaching behavior before supervisory treatment.

2. Supervisory treatment tends to promote a significant relationship between attitudes and teaching behavior.

3. Self-supervision tends to promote indirect teaching.

4. Self-supervision tends to promote higher scores on the MTAI.

5. Estimates by student teachers of the percentage of indirect teaching they exhibit in their lessons are very inaccurate under both traditional supervision and self-supervision.

6. No significant relationship exists between time and attitude change in student teachers supervised in a traditional manner.

The method of self-supervision studied would seem to provide a desirable alternative in the supervision of secondary student teachers where indirect teaching and pupil-accepting attitudes are sought. Self-supervision was received favorably by student teachers and their pupils as well as by college and school faculty members.

The technique of self-supervision studied is a new approach in teacher education. This study has provided evidence of its effect on certain student teacher attitudes and behavior, and thereby provides a basis for decisions about the practicality and effectiveness of such self-supervision for further use in student teaching programs as well as for decisions about further study of this technique.

II. Introduction

A. Background

Student teaching can be a learning experience for prospective teachers if it provides opportunities for the analysis of and consequent change in their teaching behavior. Traditionally the classroom behavior of student teachers has been evaluated and analyzed by school and college personnel in cooperation with the student teachers. There has been no formal practice in which student teachers have completely assumed a supervisory role with respect to their own teaching behavior, largely because it has only recently become practical to provide student teachers with the conditions upon which complete self-supervision depends (by using video-tape to combine the immediacy factor with faithful reproduction and by providing a system for categorical analysis of teaching behavior).

Self-supervision provides a new dimension in educational supervision which may be useful to the student teacher not only during his student teaching but also when he later assumes full responsibility as an employed teacher with infrequent supervisory assistance. It is important for us to provide student teachers with the opportunity and means whereby they may supervise themselves and for us to examine such self-supervision to determine its effectiveness. One of the first steps toward the determination of its effectiveness is to discover some of the things that take place during and after self-supervision.

Educators recognize that there is a gap between what teachers know and how they behave even in areas thought to be as critical to good teaching as is the "helping relationship."[1] Findings based on scores on the Minnesota Teacher Attitude Inventory[2] indicate that the effect of the emphasis placed on the development of encouraging, accepting teacher behavior by teacher education programs and the more permissive, cooperative attitudes held by student teachers seems to slip somewhere

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[1]Arthur W. Combs and Daniel W. Soper, "The Helping Relationship as Described by 'Good' and 'Poor' Teachers," Journal of Teacher Education, 14:67, March, 1963.

[2]Walter W. Cook, Carroll H. Leeds, and Robert Callis, Minnesota Teacher Attitude Inventory Form A (New York: The Psychological Corporation, 1951). The authors of the MTAI report in the Manual a significant decrease in scores after six months of teaching experience indicating that teachers tend to exhibit more attitudes less helpful to establishing good rapport with pupils after they have taught than before they have taught (see pp. 12-13 of Manual).

between the cup of theory and the lip of practice[3] notwithstanding the fact that the philosophy of education implied by the items of the MTAI is widely accepted as is evidenced by the use of this instrument to select good teachers[4] and to predict success in teaching.[5] Instruments for categorizing the behavior of teachers such as that developed by Flanders[6] reflect an educational philosophy similar to that of the MTAI in their construction and in findings related to their use. Both the MTAI and Flanders' categories for interaction analysis are used in this study in order to determine the interrelationship among attitudes, interaction behavior, and self-supervision (see Appendix A for a discussion of relationships between these instruments).

Since the attitudes of the student teacher's membership group appear to differ from those of his reference group (experienced teachers), and since he will be influenced to change his attitudes toward those of the reference group,[7] a strong tie lessening the width of the interval between theory and practice is desirable. If the student teacher is to retain the kind of predisposition to behavior provided for him by professional education courses, this tie

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[3]Robert Callis, "Change in Teacher-Pupil Attitudes Related to Training and Experience," Educational and Psychological Measurement, 10:718-727, 1950; Robert D. Price, "The Influence of Supervising Teachers," Journal of Teacher Education, 12:472-473, December, 1961. Contrary findings for student teachers are reported by D. L. Sandgren and L. G. Schmidt, "Does Practice Teaching Change Attitudes Toward Teaching?" Journal of Educational Research, 49:673-680, 1956.

[4]Lloyd S. Standles and W. James Popham, "Too Much Pedagogy in Teacher Education?" Bulletin of the National Association of Secondary School Principals, 45:80-81, December, 1961.

[5]William H. Edson, "Selecting Students for the College of Education at the University of Minnesota," Journal of Teacher Education, 14:55, March, 1963.

[6]N. A. Flanders, "Teacher Influence, Pupil Attitudes and Achievement," (U.S. Office of Education Cooperative Research Project No. 397, 1960, Mimeographed).

[7]A. E. Siegel and S. Siegel, "Reference Groups, Membership Groups, and Attitude Change," Journal of Abnormal and Social Psychology, 55:360-364, 1957.

approaches necessity.[8] He could benefit[9] from examining his own behavior for improvement,[10] defending his position through internal direction in order to resist external persuasion,[11] developing a set for pertinent data,[12] and utilizing a problem-solving approach which is so useful in producing behavioral change when necessary.[13] In this study, self-supervision through use of video-tape and interaction analysis provides opportunity for the student teacher to benefit from each of these desirable approaches as well as eliminating the anxiety produced by the presence of a supervisor[14] and overcoming the difficult task of convincing the student teacher that what the supervisor reports has really happened.[15] The combined use of video-tape and interaction analysis in self-supervision seems to produce a

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[8]John Walton, "The Study and Practice of Teaching," The School Review, 69:136-150, Summer, 1961; Wooley, Ethel and Ralph L. Smith, "Studio Teaching Before Student Teaching," Journal of Teacher Education, 13:333-339, September, 1962.

[9]For evidence that attention to "indirect teaching" (which corresponds to the educational philosophy of the MTAI) in the Flanders system is desirable see Martin Haberman, "The Teaching Behavior of Successful Interns," Journal of Teacher Education, 16:213-220, June, 1965.

[10]Eleanor S. Izard and Emily J. Sherwood, "Counselor Behavior and Counselee Expectations As Related to Satisfactions With Counseling Interview," Personnel and Guidance Journal, 42:920-921, May, 1964.

[11]Fred N. Kerlinger, "Educational Attitudes and Perceptions of Teachers: Suggestions for Teacher Effectiveness Research," The School Review, 71:1-11, Spring, 1963; Arthur W. Combs, The Professional Education of Teachers (Boston: Allyn and Bacon, Inc., 1965); W. J. McGuire, "Inducing Resistance to Persuasion," in Berkowitz (editor), Advances in Experimental Social Psychology (New York: Academic Press) pp.200-221.

[12]M. C. Wittrock, "Set Applied to Student Teaching," Journal of Educational Psychology, 53:175-180, August, 1962; Association for Student Teaching, The College Supervisor-Conflict and Challenge (Forty-Third Yearbook, Dubuque, Iowa: Wm. C. Brown Co., 1964) p.94.

[13]Henry Weitz, Behavioral Change Through Guidance (New York: Wiley and Sons, 1964).

[14]Association for Student Teaching, op. cit., p. 119.

[15]Association for Student Teaching, op. cit., p. 120.

package extending the desirability of video-tape[16] and interaction analysis[17] as recognized by leading educators.

The technique of self-supervision used in this study also involved the structural concept of micro-teaching (short lessons taught to small groups) developed in the Stanford Teacher Education Program and found there to be an effective means of improving teaching. The Stanford materials focusing on aspects of teaching behavior, however, were not used. Micro-teaching was well received by student teachers during a three year period of experimentation at Stanford.[18]

B. Problem and Purposes

The attitudes of student teachers toward pupils and school work are recognized as elements central to effectiveness in classroom situations. These attitudes affect teacher-pupil relations by influencing the ways in which student teachers interact with pupils. In the case of self-supervision, the attitudes of student teachers may also be involved when they consciously select those behaviors to be repeated and those to be eliminated or minimized. Systematic attention to their own patterns of interaction with pupils may also have an effect upon these attitudes as well as on the interaction behavior demonstrated after self-supervision. This study examined the effect of student teachers' attitudes on the incidence of direct and indirect control in their classroom interaction behavior, when they supervised themselves and when they were supervised in a more traditional manner. It also examined the effect of self-supervision on change in interaction behavior in lessons taught by student teachers and the effect of self-supervision on their attitudes toward pupils and classwork.

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[16]William W. Brickman, "Portable T. V. Recorder for Student Teachers," School and Society, 92:330, November, 1964; Herbert Schueler and Milton J. Gold, "Video Recordings of Student Teachers - A Report of the Hunter College Research Project Evaluating the Use of Kinescopes in Preparing Student Teachers," Journal of Teacher Education, 15:358-364, December, 1964.

[17]Edmund Amidon and Anita Simon, "Teacher-Pupil Interaction," Review of Educational Research, 31:130-136, April, 1965; George Margosian, "Suggestions for the College Supervisor," National Education Association Journal, 54:39, April, 1965.

[18]Dwight W. Allen, Jimmie C. Fortune, Kevin A. Ryan, and Robert L. Bush, "Micro-Teaching: A Description," (Palo Alto, California: Stanford University School of Education, Summer, 1966), p. 5-10 of Allen and Fortune et passim.

Both portions of the study (Fall 1967 and Spring 1968) compared instances of self-supervision by student teachers, in which they applied the Flanders system of interaction analysis to their own teaching behavior recorded on video tape with instances of supervision of student teachers in a more traditional manner in order to determine the following relationships: 1. certain attitudes of student teachers to the kind of interaction behavior they demonstrate, 2. self-supervision to change in interaction behavior, 3. self-supervision to change in certain attitudes of student teachers, and 4. observed amounts of certain kinds of interaction behavior exhibited by student teachers to their estimates of such amounts.

III. Methods

A. General design and procedures.

The general design of the total study employed four distinct but comparable groups of student teachers. The activity schedule for each of these groups is listed below.

Fall 1967

Group 1

a. Take attitude inventory
b. Be trained in interaction analysis
*c. Teach 20-minute content lesson before video-tape recorder to pupils
*d. View taped lesson, analyze interaction
**e. Reteach same content to different pupils for video-taping - 20 minutes
**f. View taped lesson, analyze interaction
g. Retake attitude inventory

Group 2

a. Take attitude inventory
*b. Teach 20-minute content lesson to pupils without video-tape recorder
*c. Receive report of interaction patterns observed by principal investigator during lesson - 20 minutes
**d. Reteach same content to different pupils without video-tape recorder - 20 minutes
**e. Receive report of interaction patterns observed by principal investigator during lesson - 20 minutes
f. Retake attitude inventory after 12 weeks
g. Retake attitude inventory after 30 weeks

*Supervisory treatment episode #1
**Supervisory treatment episode #2

Spring 1968

Group 1

a. Take attitude inventory
b. Be trained in interaction analysis
*c. Teach 20-minute content lesson before video-tape recorder to pupils
*d. View taped lesson, analyze interaction
**e. Reteach same content to different pupils without video-tape recorder - 20 minutes

Group 2

a. Take attitude inventory
*b. Teach 20-minute content lesson to pupils without video-tape recorder
*c. Receive report of interaction patterns observed by principal investigator during lesson - 20 minutes
d. Be trained in interaction analysis
**e. Reteach same content before video-tape recorder to

**f. Receive report of interaction patterns observed by principal investigator during lesson - 20 minutes	different pupils - 20 minutes
g. Retake attitude inventory	**f. View taped lesson, analyze interaction
	g. Retake attitude inventory

*Supervisory treatment episode #1
**Supervisory treatment episode #2

Group 1 (self-supervision), Group 2 (traditional supervision) Group 3 (mixed SS, TS), and Group 4 (mixed TS, SS) were scheduled to go through the activities above so that the following questions could be answered:

1. In the first lessons analyzed by the Flanders' system how much indirect and direct influence behavior is exhibited by student teachers with high scores, low scores, and scores near the mean on the MTAI (data from first lessons of Groups 1, 2, 3, 4)?

   a. Is the relationship noted between attitudes and behavior different when the first lesson is self-supervised (data from Groups 1 and 3) than it is when the first lesson is traditionally supervised (data from Groups 2 and 4)?

2. Is the change in amount of indirect and direct influence behavior from the first to the second analyzed lesson greater, less, or the same among the following cases: when the first is self-supervised, the second self-supervised (Group 1); when the first is self-supervised, the second traditionally supervised (Group 3); when the first is traditionally supervised, the second traditionally supervised (Group 2); when the first is traditionally supervised, the second self-supervised (Group 4)?

3. Does the sequence of types of supervision outlined in #2 above have an effect on the degree to which scores on the MTAI after twelve weeks change (if changes are noted)?

Group 2 was not taught skills in interaction analysis so that it could be closer to traditionally supervised groups in common practice. This statement also applied to Group 4 before student teachers taught traditionally supervised lessons.

An additional basis for comparison was incorporated into the study to determine changes in MTAI scores over time by administering the MTAI to Group 2 during the Spring semester, thereby providing an initial score, a score after twelve weeks, and a score after thirty weeks for student teachers in that group.

For consistent data in analysis of interaction behavior with the Flanders system, the principal investigator in this study analyzed each lesson and supervised all lessons not to be taped. However, as noted above, student teachers used their own analyses during self-supervision. In keeping with Flanders viewpoint, no value judgments concerning the Flanders categorieswere expressed by the principal investigator to student teachers. The second administration of the attitude inventory occuredafter twelve weeks for all groups to afford opportunity for better comparison with findings of Sandgren and Schmidt (see Appendix F).

Each student teacher estimated the amount of his indirect and direct influence behavior after each afternoon lesson (and before the supervisor's report in traditionally supervised lessons in Groups 2, 3, and 4) in terms of percentages, e.g. "I think that I exhibited indirect influence about 70 percent of the time and direct influence about 30 percent of the time." Such estimates were compared with the principal investigator's ratings.

It is very difficult to estimate the number of interactions that may occur in a classroom. A more meaningful and less varying measure is the percent of any kind of interaction for individual teachers. From the Flanders scale three measures were used. The first dependent measure was a percent of indirect teaching. This measure consisted of 100 times the sum of interactions recorded for items 1, 2, 3, 4 and 9 divided by the sum total of all interactions. The second dependent measure was a percent of direct teaching formed by dividing 100 times the sum of items 5, 6, 7 and 8 by the sum of all recorded interactions. The third measurewas a measure of silence or confusion as designated by dividing 100 times item 10 figures by the sum of all recorded interactions.

B. Population and Sample

The teacher-trainee sample who were the subjects of the study took a pretest MTAI prior to their random assignment to treatment groups. From this pretest the groups were categorized into three stratifications: (a) High MTAI group which consisted of those students scoring one-standard deviation or more above the MTAI mean, (b) Average MTAI group which consistedof those students scoring within one standard deviation of the mean, and (c) Low MTAI group which consisted of those students scoring below one standard deviation from the mean. Random assortment procedures then distributed equal representation of those groups into each of the treatment groups, rendering better comparability of groups for change analysis. The Fall and Spring student teaching populations were tested for comparability of groups and the second sample was assigned with regard to the prior stratification of the first sample. In all, eighty-four undergraduate, secondary student teachers who did their student teaching for an entire semester in one of the following fields were the subjects of this study: English, social studies, science, and math.

1. Fall 1967

Subjects for the study were selected from all secondary student teachers in the Fall of 1967 at the School of Education at Memphis State University. All subjects met the following criteria: undergraduate, secondary education, part-day, full-semester student teachers in the fields of English, social studies, science, and mathematics. These criteria were chosen since they identified the largest single sub-group of secondary student teachers at Memphis State University and perhaps in many other university teacher education programs. The original plan for the study called for two groups of 24 student teachers during the Fall semester; however, because of an unusually light student teaching enrollment only 41 student teachers met the established criteria. Of the 41 subjects, eleven did their student teaching in junior high schools (five of these were in Group I) and 29 did their student teaching in high schools.

From the final list of 41 participants involved in the project during the Fall semester, the raw scores on the MTAI were analyzed to determine the mean and standard deviation for the total group. The scores were then trichotomized. One group contained all scores greater than one standard deviation from the mean. Another group contained all scores less than one standard deviation below the mean. The final group contained all scores falling within one standard deviation either way of the mean. Each one of the three previously trichotomized groups was randomly divided into two groups. Finally, the score cards were collected in such a manner as to have two groups with equal numbers of highs, lows, and averages. However, complete randomization was not possible because of administrative procedures involved in student teacher supervision. No internal threat to validity was offered by this fact because the statistical analysis that was employed does not require complete randomization of intact groups. The final number of students participating in the study for the Fall term was 41. Therefore, it was necessary to have unequal numbers in the two groups. The decision was made to give the larger group the stronger treatment. This was done to offset any internal bias that might arise from unequally weighted groups in the final analysis.

One of the subjects in the stronger treatment group (Group I) withdrew from student teaching before his second afternoon lesson thereby reducing the number of subjects in Group I to twenty -- the same number as were in Group II. The following table describes characteristics of both groups by level of MTAI score and by subject area.

TABLE 1

Group I				Group II			
MTAI	Number	Subject	Number	MTAI	Number	Subject	Number
Low	3	Science	2	Low	3	Science	3
Average	14	English	8	Average	14	English	6
High	3	Math	3	High	3	Math	3
		Social Studies	8			Social Studies	8

Twelve men and twenty-eight women were involved in the Fall as subjects; ninety percent of the subjects were under 25 years old with most of these being 21 years old.

Five pupils for each twenty-minute lesson were selected at random from the secondary school classes which each student teacher taught.

2. Spring 1968

At the beginning of the Spring semester, all secondary education student teachers in the areas of mathematics, English, social studies, and science were given the MTAI. Then scores were trichotomized utilizing the same critical areas as in the Fall sample of student teachers. This allowed for comparable groups. From each of the three sets of MTAI scores, below average, average, and above average students were selected at random in such a manner as to insure representation among levels comparable to the groups in the Fall samples. Two such groups were selected at random and the assignment of the experimental treatment was made by flipping a coin. Because of difficulties similar to those experienced in the Fall, the study in the Spring involved forty-four subjects instead of the originally planned forty-eight.

The following table describes characteristics of both groups by level of MTAI score and by subject area.

TABLE 2

Group III				Group IV			
MTAI	Number	Subject	Number	MTAI	Number	Subject	Number
Low	4	Science	3	Low	4	Science	2
Average	14	English	11	Average	14	English	12
High	4	Math	2	High	4	Math	1
		Social Studies	6			Social Studies	7

Nine men and thirty-five women were involved in the Spring as subjects; ninety percent of the subjects were under 25 years old with most of these being 21 years old.

Five pupils for each twenty-minute lesson were selected at random from the secondary school classes which each student teacher taught.

C. Data and Instrumentation

Units of content for all twenty-minute afternoon lessons were developed by each student teacher from his own content area. Self-supervising student teachers were acquainted with the rationale for the use of the Flanders system as a tool for analysis of verbal teaching behavior and were given the Flanders material (Appendix E). A one-hour lesson to train student teachers in the Flanders system of interaction analysis was prepared and taught by the Principal Investigator. During this lesson (which was taught one week after subjects received the Flanders material) subjects were given the opportunity to practice using the Flanders system while observing a lesson (ten minutes) and to clarify their understanding of each category. No other training with the Flanders system occured. Student teachers at Memphis State University are typically unfamiliar with the Flanders system of interaction analysis.

The Minnesota Teacher Attitude Inventory (Form A) was administered to all subjects during the first week of the semester and again after twelve weeks of student teaching. It was made clear that scores on the inventory were not "good" or "bad" but simply points on a continuum and that these scores would have no bearing on student teaching grades.

Percentages of "direct" and "indirect" teaching influence derived through use of the Flanders system tend to provide a more stable measure than the MTAI scores and consequently offer the prime criterion source.

The Sony portable video-tape recorder (model VC2000) was used to tape the self-supervised afternoon lessons. Two Sony Dynamic microphones were used for sound reproduction. Although the Flanders system is a system of verbal interaction analysis which has been used by teachers with audio-tape recorders, there are often statements in the classroom which cannot be accurately interpreted unless the speakers can be seen. This fact is clearly exemplified by Flanders instructions for the use of the system and especially by the descriptions for category number three. The reader is again referred to Appendix E. Consequently, video-tape recordings were used in this study.

D. Analysis

For the study of relationships both pretest and posttest MTAI scores provide the indices of attitudes. A Flanders interaction analysis was made for both teaching encounters, providing two indices of indirect teaching for each student teacher. Two 2-way analysis of variance models were used on the indirect teaching scores collected during the first teaching encounter. The second analysis was made on the second set of indirect teaching scores. Both analysis of variance models were built around classification by supervisory treatment groups over four levels and classification by the three divisions of the MTAI scores.

The relationship of self-supervision to change in interaction behavior was ascertained through an analysis of covariance model made upon the second set of indirect teaching scores using the first set of indirect teaching scores as a covariant. This model was over the four levels of supervisory treatment. Another analysis of covariance model over four levels of supervisory treatments was made on the MTAI posttests using the MTAI pretests as covariants to study the attitude changes.

E. Time Schedule

The data for this study was collected during both semesters of the academic year. The tables below indicate the tasks engaged in during each semester.

TABLE 3

Weeks in Fall Semester 1967	Group I	Group II
1	Take MTAI	Take MTAI
2-6	Be trained in interaction analysis and teach self-supervised lesson	Teach lesson without video-tape for traditional supervision
7-12	Reteach same content to different pupils for self-supervision	Reteach same content to different pupils without video-tape for traditional supervision
13	Retake MTAI	Retake MTAI
14-18	Analysis of data from Fall semester	

TABLE 4

Weeks in Spring Semester 1968	Group III	Group IV
1	Take MTAI	Take MTAI
2-6	Be trained in interaction analysis and teach self-supervised lesson	Teach lesson without video-tape for traditional supervision
7-12	Reteach same content to different pupils without video-tape for traditional supervision	Be trained in interaction analysis and teach same content to different pupils for self-supervision
13	Retake MTAI	Retake MTAI
14-18	Analysis of data from Spring semester	

F. Administrative Arrangements

The Principal Investigator spoke with Mr. Joe Warlick, Director of Secondary Education, and Mr. Morgan Christian, Assistant Superintendent in Charge of Instruction, at their offices in the Memphis City Schools Administration Building; informed them of the study and obtained their permission to request approval from principals of the secondary schools in which the subjects of the study were to do their student teaching (see Appendix B for the list of schools and principals). These principals were then met with individually and informed of the study. In every case, approval was granted.

Supervising teachers involved were taken memorandums outlining procedures of concern to them by the student teacher subjects (see Appendix C). Each teacher was visited personally by the Principal Investigator and their cooperation was enlisted. Notes to the parents of the pupils involved were prepared for distribution to the pupils who expressed an interest in participating (Appendix D).

At the start of each semester, the Minnesota Teacher Attitude Inventory was administered to all undergraduate secondary student teachers at Memphis State University College of Education who would be doing their student teaching for the entire semester in the fields of English, social studies, science, or mathematics. These students were told that the inventory had no bearing on their grades and that the scores would be used as information for the University if any improvements in the student teaching program were to be considered. Student teachers were not told what their scores were.

G. The Student Teaching Program

Student teachers at Memphis State University may choose to do their teaching either for an entire semester for three hours each day or for one-half of the semester on a full day basis; the great majority of secondary student teachers choose the entire semester system. They are assigned a university supervisor who observes their teaching on the average of three hours and confers with them for an average of three hours individually. These observation-conference sessions normally occur on three separate days during the semester. Student teachers meet in groups with their university supervisors each week to discuss teaching problems. Assignments of supervising teachers in the secondary schools are generally made at the suggestion of the principal in the school to which student teachers are assigned. Letter grades for student teachers are jointly determined by their supervising teachers and their university supervisors.

The Principal Investigator was the university supervisor for the eighty-four student teachers who were the subjects of this study. The subjects were notified of his visits to their classrooms if they preferred; otherwise he came unannounced. Approximately 25 percent of the subjects requested prior notification. He made two one-hour classroom observations of student teachers teaching in the secondary schools. These observations were made on different days and each was followed by a one-hour conference about teaching problems. The Flanders system was not used during these observations in secondary school classrooms. The observations were part of the regular student teaching program and were supplemented by the supervision of two short lessons for each student in the afternoons. Student teachers were supervised in keeping with the activity schedule outlined in section III A.1. above. In all his observations and conferences with the student teachers, the Principal Investigator was typically non-directive in approach. Areas of concern were identified by the student teachers from a framework of emphasis on behavioral objectives, appropriate activities, and evidence of success during teaching encounters. Especially during the first individual conference following the first observation of each student teacher the Principal Investigator was typically supportive and accepting in his behavior toward the student teacher. In his personal evaluations of teaching behavior the Principal Investigator tends to favor indirect, encouraging behaviors.

The quality and quantity of student teaching experiences engaged in by student teachers in this study was judged to be comparable to the experiences engaged in by other student teachers at Memphis State University who were not selected as subjects. Group I student teachers had one third less observation-conference contact with their University Supervisor than did other student teachers at Memphis State University since Group I student teachers supervised themselves for that portion

of the normal observation-conference time. Observation-conference contact with the University Supervisor was also somewhat reduced for Group 3 and 4 subjects when compared with Group 2 (traditional supervision) subjects.

E. Afternoon Lessons

Each student teacher who was a subject in this study selected five different interested pupils at random from his classes for each of two twenty-minute lessons which were taught on separate afternoons in one of the classrooms in the School of Education Building. All of these twenty-minute lessons were taught after normal school hours. Reports from student teachers, pupils, principals, and cooperating teachers indicated the feeling that the afternoon lessons were both enjoyable and profitable.

At the first seminar meeting all participants were asked to list the afternoon that it would be inconvenient for them to teach a lesson at Memphis State University. It was felt that requiring a participant to miss a previously set appointment or an afternoon class would cause confusion for all parties involved. Transportation for the high school students involved in the study would be difficult if the supervision were scheduled for an afternoon when the student teacher had a class. Also, a student teacher who was to be supervised immediately after attending a class might feel tired or pushed for time. Therefore, it was decided that the schedule for afternoon lessons would be made for the convenience of the participants. No attempt was made to randomly assign participating student teachers to the schedule. The afternoon lesson schedule was set up to work around the time that would be difficult for the individual student teachers. It was also decided that individual participants in the self-supervision group would be released from the regular Thursday afternoon seminars if they were to teach on that afternoon. This decision will not threaten validity because a certain number of absences may be expected over the length of time involved in this study in the normal course of events.

It was decided that the order in which the student teachers taught their second lessons should be the same as the order in which they taught their first lesson. Again, as in the first scheduling, the dates for teaching afternoon lessons were assigned with regard to the convenience of the individual student teachers. Scheduling in this manner gave all participants approximately the same amount of time between the two teaching experiences. This general procedure was adhered to as much as possible. Certain changes were required, though. School holidays and previous committments by the Principal Investigator necessitated a few minor changes, none of which was seen as a threat to internal validity. It was decided that, generally, one representative from each of the two treatment groups involved during each

semester should teach each afternoon. For this reason, on the days when the Investigator had previous committments, no taping of self-supervision student teachers was done. In this way, the schedules of teaching for the two treatment groups were kept as close together as possible.

On the afternoons that self-supervising teachers were to be video-taped, the video-tape recorder was set up prior to the arrival of the student teacher with his class of five for the micro-teaching session. The camera, recorder, and T.V. monitor were placed in the back of the room, facing the blackboard, teacher's desk, and five chairs. When the student teacher arrived with the students, they were welcomed to the University and an attempt was made to make them feel at ease in the presence of the camera. The procedures to be used in the taping of the lesson were explained to everyone, a test was made to determine if the equipment was functioning properly, and then the final preparations for taping were begun. The student teacher was reminded that the lesson should be twenty minutes long. He was told that if, at the end of twenty minutes when the machine was turned off, the lesson was not concluded, some attempt should be made to sum up so that the pupils would not be confused. Any questions concerning procedures were answered at this point. All answers given to these questions were given with the overall study in mind. All questions were answered truthfully, and attempts were made to soothe any anxieties of the students or the student teachers. But at no time did the assistant allow the answers given to jeopardize the internal validity of the study. At this point the video-recorder was started and the assistant left the room. After twenty minutes the assistant returned to the room and turned the machine off immediately. At all times the lesson was drawn to an end within two or three minutes after the re-entrance of the assistant. The pupils were thanked for their cooperation and given their stipend from project funds, for which they then signed a receipt. The students were reminded that they would be taken on a tour of the campus. At this time the assistant asked the student teacher for a percentage estimate of the amount of direct and indirect teaching he demonstrated in the lesson. The student teacher was shown how to operate the video-tape recorder and reminded that the tape was to be watched once and that the interaction behavior was to be analyzed by using the Flanders system. At this point the student teacher was left alone as the pupils began their tour of the campus with the assistant. After approximately thirty minutes the tour was concluded and the pupils were returned to the student teacher for transportation to their homes.

Throughout the year, it was made clear to self-supervising student teachers that video-tapes of their lessons were for their use in self-improvement, and that no one in authority over them would view those video-tapes. In order to adhere to this promise, the Principal Investigator did not view any tapes until after student teaching grades had already been recorded.

Traditionally-supervised student teachers were observed by the Principal Investigator during each of their two twenty-minute afternoon lessons; a supervisory conference lasting approximately thirty minutes was then held by the Principal Investigator with the student teachers. Pupil stipend, tour, physical arrangements and other organizational procedures were identical to those reported above for the self-supervised lessons; there was no video-tape recorder in the room during traditionally-supervised lessons.

Teacher-pupil interaction was analyzed by the Principal Investigator using the Flanders system of interaction analysis (Appendix E) during the twenty-minute afternoon lessons taught by traditionally-supervised student teachers, and at the end of each semester when he viewed the video-taped lessons taught by self-supervising student teachers.

Throughout the year, every effort was made to approach the afternoon lesson activities and the student teaching seminars in such a way as to suggest that these experiences were simply an addition to the usual student teaching program. Procedures which might indicate an experimental group-control group delineation were carefully avoided.

IV. Results and Findings (Fall 1967)

(See Appendix A for an indication of the characteristics of MTAI scores and indirect teaching behavior since these factors will be referred to throughout this section.

A. Relationship 1

In order to determine the relationship between certain attitudes of student teachers and the kind of interaction behavior they demonstrate, a two-way analysis of variance was performed. This statistical treatment showed no significant relationship between MTAI scores and percentages of indirect teaching in the first afternoon lesson; however, no significant difference between groups or among levels within groups was observed in this regard. (see Table 5)

Table 5

Two-Way Analysis of Variance: Percentages of Indirect Teaching Behavior on First Afternoon Lesson

MEANS
MTAI LEVEL

	High	Average	Low
Group I	16.16	17.85	15.60
Group II	14.00	17.12	17.33

Source	Sum of Squares	df	Mean Square
Between Groups	3.24	1	3.24
Between Levels	30.42	2	15.21
Interaction	11.94	2	5.97
Within Cells	2820.61	34	82.95
Total		39	

		Significance Level
Between Groups Ratio Is	.03	N.S.
Between Levels Ratio Is	.18	N.S.
Interaction Ratio Is	.07	N.S.

In the second afternoon lesson, however, a two-way analysis of variance showed a significant difference (at the .05 level) between groups concerning the relationship of MTAI scores and percentages of indirect teaching. A significant difference (at the .01 level) was also observed among levels within groups. No interaction was found. (see Table 6)

Table 6

Two-Way Analysis of Variance: Percentages of Indirect Teaching Behavior on Second Afternoon Lesson

MEANS
MTAI LEVEL

	High	Average	Low
Group I	38.20	28.85	16.06
Group II	32.50	19.60	21.40

Source	Sum of Squares	df	Mean Square
Between Groups	426.40	1	426.40
Between Levels	894.98	2	447.49
Interaction	263.93	2	131.96
Within Cells	2473.80	34	72.75
Total		39	

		Significance Level
Between Groups Ratio Is	5.86	.05
Between Levels Ratio Is	6.15	.01
Interaction Ratio Is	1.81	N.S.

Since the F ratios among levels on the second afternoon lesson analysis were found to be significant at the .01 level (see Table 6), further analysis of the data was done in order to explore the sources of this finding. A Pearson product-moment correlation was done using each subject's initial MTAI score and the percentage of indirect teaching on the second lesson. (see Table 7)

Table 7

Mean Pearson Product-Moment Correlations Using MTAI Scores And Percentage of Indirect Teaching Behavior in Lesson 2

MTAI Level

	High	Average	Low
Group I	+.73	-.30	+.44
Group II	+.54	-.06	-.89

B. Relationship 2

In order to determine the relationship between self-supervision and change in interaction behavior, a two-way analysis of variance was performed. The results indicated that there was no significant difference in the percentage of indirect teaching between the self-supervision (Group I) and the traditional supervision (Group II) in the first afternoon lesson; moreover, no significant difference was found among MTAI levels within groups (see Table 5). A significant difference both between groups and among levels was found, however, in the second afternoon lesson indicating a higher percentage of indirect teaching for the self-supervision group (see Table 6).

Since a significant difference was noted among MTAI levels on the second lesson, additional analysis was done using the Schefee' s - contrast test to compare the percentage of indirect teaching in the first and second afternoon lessons for individual subjects. For high MTAI level subjects in both groups a strong trend (at the .06 level) toward significant increase in the percentage of indirect teaching from the first to the second afternoon lesson was found. A significant increase (at the .01 level) was found for average MTAI level subjects in the self-supervision group.

No significant increase or trend toward significant increase was noted in either the average MTAI level of the traditional supervision group or in the low MTAI levels in both groups.

C. Relationship 3

In order to determine the relationship between self-supervision and change in certain attitudes of student teachers an analysis of co-variance was done (see Table 8). The F ratio indicated that there was no significant difference between the posttest means of the groups at the .05 level. The F ratio, however, was significant at the .10 level (see Appendix E for comparison with findings of other studies).

Table 8 (continued on page 23)

Analysis of Covariance: MTAI Scores
on Pretest and Posttest

MEANS

	Group I	Group II
Pretest	42.95	38.55
Posttest	45.15	29.85

	Total	Within	Between
Sum of Products	17,679.00	17,005.80	673.20
Sum of Squares: X	31,824.00	29,483.10	2,340.90
Sum of Squares: Y	19,689.00	19,495.90	2,763.40
Df	39	38	1
Correlation	.70	.70	.26
Df of r	38	37	0
Bxy Value	.89	.87	.24
Adjusted Sum of X^2	15,950.20	14,649.35	1,300.85
	38	37	1

Between Group Variance Is	1300.85
Within Group Variance Is	395.92
The F Ratio Is	3.28

Since the posttest score of one subject in each group changed more than two standard deviations from the mean it was felt that further analysis would be helpful in interpreting the data. To supplement findings from the analysis of co-variance, an analysis of variance was done after removing the scores of the two subjects whose scores changed more than two standard deviations from the mean (see Table 9). The analysis of variance treatment was chosen for expediency since the findings from the co-variance treatment did not yield information significantly different from that which analysis of variance yields. An F ratio of 4.60 (significant at the .05 level) was found indicating that the 48.8 posttest mean score for the self-supervision group (Group I) represents a significant increase when compared with the 31.5 mean posttest score for the traditional supervision group (Group II).

Table 9

Analysis of Variance Scores on MTAI Posttest Without Two Scores Which Were More Than Two Standard Deviations From The Mean

MEANS

Group I	48.8
Group II	31.5

Source	Sum of Squares	df	Mean Square
Between Groups	2831.15	1	2831.15
Within Groups	23381.90	36	615.31

		Significance Level
Between Group Ratio Is	4.60	.05

D. Relationship 4

In order to determine the relationship between percentages of certain kinds of interaction behavior estimated by student teachers and percentages of certain kinds of interaction behavior found through use of the Flanders system, a two-way analysis of variance was done. No significant F ratios were found between groups or between lessons; no significant interaction was noted (see Table 10).

Table 10

Two-Way Analysis of Variance: Differences in Student Estimate and Investigators Analysis Using Flanders System

MEANS

	Group I	Group II
First Lesson	21.14%	18.97%
Second Lesson	23.08%	24.36%

Source	Sum of Squares	df	Mean Square
Between Groups	3.96	1	3.96
Between Lessons	268.64	1	268.64
Interaction	59.85	1	59.85
Within Cells	21027.15	76	276.67
Total		79	

		Significance Ratio
Between Groups Ratio Is	.01	N.S.
Between Levels Ratio Is	.97	N.S.
Interaction Ratio Is	.20	N.S.

For the first afternoon lesson there was an average 20.06 percentage point difference between the estimates of student teachers and the percentage findings of the principal investigator when he used the Flanders system to analyze each afternoon lesson. On the second afternoon lesson there was an average 23.72 percentage point difference. These differences should be considered in relation to the mean percentages of indirect teaching found through use of the Flanders system - 16.34% for lesson 1 and 29.44% for lesson 2 in order to determine the accuracy of student teachers' estimates (see Table 11, next page).

TABLE 11

Mean Percentage Point Distance of Student Teachers' Estimates From Percentage of Indirect Teaching Behavior Found With Flanders System

	Mean Percentage Found	Mean Distance of Estimates From Findings
Lesson 1	16.34	20.06
Lesson 2	29.44	23.72

V. Conclusions (Fall 1967)

The conclusions below were drawn with respect to the methods of traditional and self-supervision which were studied with secondary student teachers teaching academic subjects; indirect teaching was determined by the Flanders system of interaction analysis. It is suggested that the reader refer to the sections indicated in parentheses following each conclusion for the source of that conclusion in the findings.

1. There is no significant relationship between MTAI score and indirect teaching before a complete supervisory treatment episode (IV A).

2. Neither the MTAI score level nor the method of supervision affects the relationship of MTAI scores and indirect teaching before a complete supervisory treatment episdoe (IV A).

3. In lessons following a complete supervisory treatment episode the relationship of MTAI score and indirect teaching is affected by both the MTAI score level and the method of supervision:

   a. For self-supervised subjects with low MTAI scores - the higher the score, the more indirect teaching;

   b. For traditionally supervised subjects with low MTAI scores - the higher the score, the less indirect teaching;

   c. For subjects with high MTAI scores under both supervisory treatments - the higher the score, the more indirect teaching (IV A).

4. Before a complete supervisory treatment episode neither the MTAI score level nor the method of supervision affects indirect teaching (IV B).

5. In lessons following a complete supervisory treatment episode both MTAI score level and method of supervision affect indirect teaching with self-supervised subjects generally exhibiting more indirect teaching:

   a. Self-supervised subjects with average MTAI scores increase significantly in indirect teaching,

   b. Subjects with high MTAI scores under both methods of supervision tend to increase in indirect teaching (IV B).

6. Self-supervision tends to increase MTAI scores significantly more than traditional supervision does (IV C).

7. Subjects' estimates of their indirect teaching are very inaccurate (IV D).

Additional data bearing on the relationships of concern in this study was collected during Spring 1968 and is treated in the following sections along with the data collected during Fall 1967.

VI. Overall Results and Findings (Fall and Spring 1967-68)

A. Relationship 1

In order to determine the relationship between certain attitudes of student teachers and the kind of interaction behavior they demonstrate, a two-way analysis of variance was performed. This statistical treatment showed no significant relationship between MTAI scores and percentages of indirect teaching in the first afternoon lesson. However, a trend toward significance among MTAI levels was noted. (See Table 12, Section A)

TABLE 12

Two-Way Analysis of Variance: Percentages of Indirect Teaching Behavior on First Afternoon Lesson

Section A

GRAND MEANS
MTAI LEVELS

High	Average	Low
25.88	19.74	22.19

Section B

GRAND MEANS
TREATMENT GROUPS

Group I	Group II	Group III	Group IV
16.53	16.15	35.93	21.79

Section C

Source	Sum of Squares	df	Mean Square
Between Groups	3351.21	3	1117.07
Between Levels	696.02	2	348.01
Interaction	806.62	6	134.43
Within Groups	9920.93	72	137.79
Total	14774.80	83	

Section D

		Significance Level
Between Groups Ratio is	8.10	.01
Between MTAI Levels Ratio is	2.52	N.S.
Interaction Ratio is	0.96	N.S.

In the second afternoon lesson a very strong trend toward a significant relationship between attitudes and percent of indirect teaching was noted among the three levels of the MTAI overall groups. (See Table 13, Section A)

TABLE 13

Two-Way Analysis of Variance: Percentages of Indirect Teacher Behavior on Second Afternoon Lesson

Section A

GRAND MEANS
MTAI LEVELS

High	Average	Low
37.04	27.43	28.67

Section B

GRAND MEANS
TREATMENT GROUPS

Group I	Group II	Group III	Group IV
27.70	24.30	37.26	34.74

Section C

Source	Sum of Squares	df	Mean Square
Between Groups	1934.11	3	632.03
Between Levels	1038.10	2	544.05
Interaction	1140.55	6	190.09
Within Groups	13152.10	72	182.66
Total	17336.88	83	

Section D

		Significance Level
Between Groups Ratio is	3.36	.05
Between MTAI Levels Ratio is	2.97	.10
Interaction Ratio is	1.02	N.S.

B. Relationship 2

In order to determine the relationship between self-supervision and change in interaction behavior in the first afternoon lesson, a two-way analysis of variance was performed. (See Table 12, Section D) This statistic revealed a significant ($p < .01$) difference between the four experimental groups. Further statistical analysis utilizing an F Statistic for contrast of means showed no significant difference between the amount of indirect teaching of Groups 1 and 2. However, there was a significant ($p < .01$) difference between the indirect teaching of Groups 3 and 4. Likewise, further analysis showed a significant ($p < .01$) difference between the amount of indirect teaching done by Groups 1 and 3. There was no significant difference between the indirect teaching of Groups 1 and 4. Therefore, it may be inferred that the main source of variance between the treatment groups in Group 3. (See Table 12, Section B) The high percentage of indirect teaching exhibited by Group 3 subjects does not lend itself to explanation within the framework of the findings from the present study.

Statistics revealed a significant ($p < .05$) difference between the amount of indirect teaching among groups in the second lesson. Further investigation using an F statistic showed no significant difference between the amount of indirect teaching of Groups 1 and 3. Likewise, no relationship was found between Groups 3 and 4. However, a significant ($p < .05$) difference was found between the amount of indirect teaching of Groups 1 and 3. (See Table 13, Section B) Because a strong trend toward significance was found between the indirect teaching of Groups 1 and 4, it may be inferred that the majority of the between group variance lies in Groups 3 and 4.

Because there was a significant difference among treatment groups in the percentage of indirect teaching on both Lesson 1 and Lesson 2, an analysis of covariance was performed to better ascertain the significance of the change in percentage of indirect teaching over the two afternoon lessons. (See Table 14) The significance found between the treatment groups in this analysis was investigated further using an F statistic. No significant difference in the change of percentage of indirect teaching from Lesson 1 to Lesson 2 was shown between Groups 1 and 4. Likewise, no relationship was found between Groups 2 and 3. However, a significant difference ($p < .01$) was found between Groups 2 and 4. A trend toward significance in behavioral change was revealed between Groups 1 and 2. Therefore, it may be inferred that the majority of the between group variance lies in Groups 1 and 4. It appears that Groups 1 and 4 underwent the greatest change in percentage of indirect teaching from Lesson 1 to Lesson 2.

TABLE 14

Analysis of Covariance: Change in Percentage of Indirect Teaching From Lesson 1 to Lesson 2 by Treatment Groups

MEANS

	Lesson 1	Lesson 2
Group I	17.26	28.33
Group II	16.69	21.80
Group III	32.02	33.02
Group IV	19.46	34.12

	Total	Within	Between
Sum of Products	8504.56	7056.05	1448.51
Sum of Squares X	17336.88	15380.76	1959.56
Sum of Squares Y	14774.80	11423.58	7557.48
df	83	80	3
Correlation	.53	.53	.37
df For r	82	79	3
BXY Value	.57	.61	.19
Adjusted Sum of X^2	12441.54	11022.41	1419.12
df	82	79	3

Between Groups Variance is	473.04
Within Groups Variance is	139.52
The F Ratio is	3.39

C. Relationship 3

In order to determine the relationship between self-supervision and change in certain attitudes of student teachers an analysis of covariance was done (see Table 15). The F ratio indicated that there was no significant difference between the posttest means of the groups at the .05 level.

A very weak trend ($p > .10$) toward change in MTAI scores was noted among the four experimental treatment groups. Inspection of the data revealed several internal, conflicting movements that, in conjunction with the error variance, prevented significant findings. However, in studying Table 15, it was noted that in two groups, I and III, there were slight changes in the means of the groups. Groups II's mean experienced a large change downward. The mean of Group IV, after the treatment, experienced an equally large change upward. However, in the overall analysis, these two changes off-set each other.

TABLE 15

Analysis of Covariance: MTAI
Scores on Pretest and Posttest

MEANS

	Pretest	Posttest
Group I	42.95	45.15
Group II	38.55	29.85
Group III	44.54	43.95
Group IV	36.95	45.36

	Total	Within	Between
Sum of Products	46795.25	46239.72	555.53
Sum of Squares X	85403.75	31967.16	3439.04
Sum of Squares Y	51867.75	51040.32	3457.60
df	83	80	3
Correlation	.70	.71	.16
df For r	82	79	3
BXY Value	.90	.90	.16
Adjusted Sum of X^2	43184.92	40076.52	3108.40
df	82	79	3

Between Groups Variance is	1036.13	
Within Groups Variance is	507.29	
The F Ratio is	2.04	N.S.

D. Relationship 4

In order to determine the relationship between percentages of certain kinds of interaction behavior estimated by student teachers and percentages of certain kinds of interaction behavior found through use of the Flanders system, a two-way analysis of variance was done.

Statistical analysis revealed a significant ($p < .01$) difference in the estimates between the four treatment groups. Further investigation by an F statistic showed no significant difference in the estimates of Groups 1 and 2. Likewise, no relationship was found between Groups 3 and 4. A significant difference ($p < .01$) was found between Groups 2 and 4. A strong trend toward significance was noted between Groups 1 and 3. Therefore, it may be inferred that the variance among groups lies between the pairs of Groups 1 and 2 and Groups 3 and 4. A significant interaction ($p < .05$) was noted. This interaction can be seen between Groups 2, 3, and 4 among levels. As the difference in estimate made by Groups 2 and 4 increases from Lesson 1 to Lesson 2, the difference in estimate made by Group 3 decreases proportionally. (See Table 16)

For the first afternoon lesson there was an average 17.76 percentage point difference between the estimates of student teachers and the percentage findings of the principal investigator when he used the Flanders system to analyze each afternoon lesson. On the second afternoon lesson there was an average 18.47 percentage point difference. These differences should be considered in relation to the mean percentages of indirect teaching found through use of the Flanders system - 22.60 percent for Lesson 1 and 31.05 percent for Lesson 2, in order to determine the accuracy of student teachers' estimates.

TABLE 16

Two-Way Analysis of Variance: Differences in Student Estimate and Investigator's Analysis Using Flanders System

MEANS

	Lesson 1	Lesson 2
Group I	21.14%	23.08%
Group II	18.97%	24.36%
Group III	20.49%	10.18%
Group IV	10.44%	15.87%

Source	Sum of Squares	df	Mean Square
Between Groups	2555.67	3	851.89
Between Levels	9.14	1	9.14
Interaction	1812.41	3	604.13
Within Groups	34031.61	160	212.70
Total	38408.39	167	

		Significance Level
Between Groups Ratio is	4.00	.01
Between MTAI Levels Ratio is	.04	N.S.
Interaction Ratio is	2.84	N.S.

E. Attitude Change Over Time

In order to determine the relationship between change in certain attitudes and time, a two-way analysis of variance was performed with data gathered from subjects in Group II. (See Table 17) No significant difference was found between scores on the three administrations of the MTAI: before student teaching, after student teaching with traditional supervision, and fifteen weeks after the close of student teaching. However, a significant difference ($p < .01$) was found between the two levels: those with teaching positions during the fifteen weeks after student teaching and those without teaching positions.

TABLE 17

Two-Way Analysis of Variance: Change in MTAI Score Over Time

MEANS
For Seventeen Group II Subjects

	Test 1	Test 2	Test 3
Teaching	44.58	39.25	42.41
Not Teaching	18.50	5.25	23.50
GRAND MEANS	31.54	22.25	32.96

Source	Sum of Squares	df	Mean Square
Between Groups	542.62	3	271.31
Between Levels	6241.00	1	6241.00
Interaction	341.54	3	170.77
Within Groups	24906.83	40	622.67
Total	32032.00	47	

		Significance Level
Between Groups Ratio is	.47	N.S.
Between MTAI Levels Ratio is	10.23	.01
Interaction Ratio is	.28	N.S.

VII. Overall Conclusions (Fall and Spring, 1967-68)

The conclusions below are drawn with respect to the methods of traditional and self-supervision which were studied with secondary student teachers teaching academic subjects; indirect teaching was determined by the Flanders system of interaction analysis.

1. No significant relationship exists between attitudes and teaching behavior before supervisory treatment.

2. Supervisory treatment tends to promote a significant relationship between attitudes and teaching behavior.

3. Self-supervision tends to promote indirect teaching.

4. Self-supervision tends to promote higher scores on the MTAI.

5. Estimates by student teachers of the percentage of indirect teaching they exhibit in their lessons are very inaccurate under both traditional supervision and self-supervision.

6. No significant relationship exists between time and attitude change in student teachers supervised in a traditional manner.

The method of self-supervision studied would seem to provide a desirable alternative in the supervision of secondary student teachers where indirect teaching and pupil-accepting attitudes are sought. Self-supervision was received favorably by student teachers and their pupils as well as by college and school faculty members.

Further studies which could provide valuable information might include the following:

1. Studies comparing the effects of self-supervision and traditional supervision with elementary student teachers and with teachers in service;

2. Studies comparing the effects of self-supervision and traditional supervision when traditionally supervised student teachers and teachers in service are extensively trained in the use of the Flanders system; and

3. Studies examining the effect of time on the teaching behavior and attitudes of self-supervised student teachers and teachers in service.

APPENDIX A

There is a very close similarity between the attitudes considered by the MTAI and the behaviors with which Flander's scale is concerned. These similarities may be seen by referring to sections #2 and #5 on the copy of material from the MTAI manual on the following pages. These sections (especially the underlined portions) relate directly to items on Flanders' scale (last page of Appendix A) as indicated on the following material reproduced from the manual.

This study dealt with a dichotomy of attitudes and behavior relating the gross divisions already present in each instrument as follows: Flanders' "indirect influence" to MTAI teachers who have "good rapport with pupils" and Flanders' "direct influence" to MTAI teachers who do not have good rapport with pupils (see Flanders' scale and MTAI manual copy section #4).

It is commonly accepted that people's attitudes are not always reflected in their behavior. Therefore, since the MTAI measures attitudes and the Flanders' scale measures behavior, student teachers who score high in pupil-accepting attitudes on the MTAI may or may not exhibit pupil-accepting behaviors when lessons are analyzed with Flanders' instrument. Because of such a relationship between attitudes and behavior, this study used both an attitude inventory and a behavior analysis scale (MTAI and Flanders Interaction Analysis) so that possible differences between attitude and behavior could be noted. The intent of the study was to examine the relationship between attitudes and behavior and to note the effect of self-supervision on both attitudes and behavior.

No attempt was made in the study to relate particular attitudes or behaviors to teaching effectiveness. However, "teaching effectiveness," although difficult to define precisely, would almost certainly require that the teacher "get along (well) with pupils in interpersonal relationships" and be "well satisfied . . . with teaching as a vocation" (see section #1 on following MTAI material). The MTAI measures attitudes which predict these factors and is sometimes used in the field to select people for teaching. There is also considerable evidence that MTAI assessment of a teacher's attitudes toward pupils and classwork correlates positively with the assessments of pupils, principals, and experts in teaching effectiveness (evidence of validity is given in the MTAI manual to this effect).

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"I. INTRODUCTION

Section #1

Investigations carried on by the authors over the past ten years indicate that the attitudes of teachers toward children and school work can be measured with high reliability, and that they are significantly correlated with the teacher-pupil relations found in the teachers' classrooms. The MINNESOTA TEACHER ATTITUDE INVENTORY has emerged from these researches. It is designed to measure those attitudes of a teacher which predict how well he can get along with pupils in interpersonal relationships, and indirectly how well satisfied he will be with teaching as a vocation. The most direct use to which the MTAI can be put is in the selection of students for teacher preparation and the selection of teachers for teaching positions. A parallel use is in counseling students about a vocational choice. These two uses stem directly from research evidence available at present. Logically, the use of the INVENTORY may possibly be extended to other areas, such as measuring the effectiveness of a teacher-educational program or measuring the ability to work with youth groups (Boy Scouts, Girl Scouts, etc.). Caution should be exercised, however, in using the INVENTORY for purposes for which evidence of validity is not yet available."

"A. CHARACTERISTICS OF TEACHERS

Section #2 (similar to Flanders' items #1, 2, 3, 4, 9)

It is assumed that a teacher ranking at the high end of the scale should be able to maintain a state of harmonious relations with his pupils characterized by mutual affection and sympathetic understanding. The pupils should like the teacher and enjoy school work. The teacher should like the children and enjoy teaching. Situations requiring disciplinary action should rarely occur. The teacher and pupils should work together in a

Section #2 (Continued)

social atmosphere of cooperative endeavor, of intense interest in the work of the day, and with a feeling of security growing from a permissive atmosphere of freedom to think, act and speak one's mind with mutual respect for the feelings, rights and abilities of others. Inadequacies and shortcomings in both teacher and pupils should be admitted frankly as something to be overcome, not ridiculed. Abilities and strengths should be recognized and used to the utmost for the benefit of the group. A sense of proportion involving humor, justice and honesty is essential. Group solidarity resulting from common goals, common understandings, common efforts, common difficulties, and common achievements should characterize the class.

Section #3 (similar to Flanders' items #5, 6, 7, 8)

At the other extreme of the scale is the teacher who attempts to dominate the classroom. He may be successful and rule with an iron hand, creating an atmosphere of tension, fear and submission; or he may be unsuccessful and become nervous, fearful and distraught in a classroom characterized by frustration, restlessness, inattention, lack of respect, and numerous disciplinary problems. In either case both teacher and pupil dislike school work; there is a feeling of mutual distrust and hostility. Both teacher and pupils attempt to hide their inadequacies from each other. Ridicule, sarcasm and sharp-tempered remarks are common. The teacher tends to think in terms of his status, the correctness of the position he takes on classroom matters, and the subject matter to be covered rather than in terms of what the pupil needs, feels, knows, and can do."

"2. THE INFERIOR TEACHER

Section #4

Items in the INVENTORY discriminate sharply between teachers who have and those who do not have good rapport with pupils; examination of these items indicates that inferior teachers are essentially insecure socially."

FLANDERS' CATEGORIES FOR INTERACTION ANALYSIS[1]

TEACHER TALK	INDIRECT INFLUENCE	1. *ACCEPTS FEELING: accepts and clarifies the feeling tone of the students in a nonthreatening manner. Feelings may be positive or negative. Predicting or recalling feelings are included. 2. *PRAISES OR ENCOURAGES: Praises or encourages student action or behavior. Jokes that release tension, not at the expense of another individual, nodding head or saying, "um hm?" or "go on" are included. 3. *ACCEPTS OR USES IDEAS OF STUDENT: clarifying, building, or developing ideas or suggestions by a student. As teacher brings more of his own ideas into play, shift to category five. 4. *ASK QUESTIONS: asking questions about content or procedure with the intent that a student answer.
	DIRECT INFLUENCE	5. *LECTURING: giving facts or opinions about content or procedure; expressing his own ideas, asking rhetorical questions. 6. *GIVING DIRECTIONS: directions, commands, or orders to which a student is expected to comply. 7. *CRITICIZING OR JUSTIFYING AUTHORITY: statements intended to change student behavior from nonacceptable to acceptable pattern; bawling someone out; stating why the teacher is doing what he is doing; extreme self-reference.
	STUDENT TALK	8. *STUDENT TALK-RESPONSE: talk by students in response to teacher. Teacher initiates the contact or solicits student statement. 9. *STUDENT TALK-INITIATION: talk by students which they initiate. If "calling on" student is only to indicate who may talk next, observer must decide whether student wanted to talk. If he did, use this category.
		10. *SILENCE OR CONFUSION: pauses, short periods of silence and periods of confusion in which communication cannot be understood by the observer.

* There is NO scale implied by these numbers. Each number is classificatory; it designates a particular kind of communication event. To write these numbers down during observation is to enumerate, not to judge a position on a scale.

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[1]Developed by Ned A. Flanders, University of Minnesota, 1959.

APPENDIX B

PARTICIPATING SCHOOLS AND PRINCIPALS

Bellevue Junior High School	Mr. Gordon L. Gilbert
Colonial Junior High School	Mr. Robert E. Ditto
Cypress Junior High School	Mr. James A. Barber
East High School	Mr. J. G. Griesbeck
Frayser High School	Mr. Leon N. Stevenson
Germantown High School	Mr. Comadore M. Ferguson
Gragg Junior High School	Mr. Everett L. Hart
Hamilton High School	Mr. Harry T. Cash
Hillcrest High School	Mr. M. C. Fryar
Kingsbury High School	Mr. Frank Billingsley
Melrose High School	Mr. Floyd Campbell
Memphis Technical School	Mr. William A. Bourne
Messick High School	Mr. Radford W. Roadbrough
Millington Central High School	Mr. William L. Ostean
Overton High School	Mr. James H. Hewlett
Sherwood Junior High School	Mr. John W. Simonton
Snowden Junior High School	Mr. Frank Farino
South Side High School	Mr. Bennett Hunter III
Treadwell High School	Mr. W. A. Maybry
Westside High School	Mr. William P. Woodard
White Station High School	Mr. Rush Siler
Whitehaven High School	Mr. R. Shannon Robison
Woodale High School	Mr. Winton D. Simmons

APPENDIX C

MEMORANDUM

TO: Cooperating Teachers

FROM: Dr. Donald F. Johnston, Associate Professor
Memphis State University

SUBJECT: Secondary Student Teachers

This year we are planning to provide learning activities for many of our student teachers in addition to the usual student teaching program. In addition to the visits I shall make as the University Supervisor, your student teacher will also have the opportunity to improve his teaching skills through microteaching (teaching short lessons to small groups of pupils). Microteaching, developed at Stanford University, has been found to be an extremely efficient method of improving the classroom techniques of student teachers.

Twice during this semester your student teacher will engage in microteaching at the University. With your cooperation and the approval of your school administrators we plan to involve five different pupils from the student teachers' classes for each microteaching session (i.e., a total of ten pupils--five on each of two days). The pupils will be taught a short lesson prepared by the student teacher in his subject area and will receive a token payment at the end of the semester at the rate of $1.25 per hour for the amount of time taken by the lesson.

Since this activity would be in the nature of an after-school field trip for the pupils, I should appreciate it if you would help your student teacher to follow procedures outlined by your school for such situations. Interested pupils will be selected at random by your student teacher who will determine a means of transportation for them. They will arrive at the University some time after 3:00 p.m. and should be home at about 5:00 p.m. Pupils will be able to see some of our facilities while they are here.

I shall stop by to introduce myself between September 22 and September 29. Thank you for your interest in working with our student teachers.

APPENDIX D

Dear Parents,

Your child has been informed of an opportunity to visit Memphis State University on _____ after school hours. He (She) has expressed an interest in making this visit.

If you indicate your approval by signing this notice, your child and four other classmates will travel with their student teacher to the University where they will be taught a short lesson; they will also be taken on a guided tour of some of the campus facilities. Each pupil will receive sixty cents as a token reward for his interest and participation in the lesson. To insure fairness, pupils will be selected for the trip at random from those who obtain parental approval. All pupils will be returned to their homes before 6:00 P. M.

Your child has been asked to return this notice tomorrow if you approve of his participation.

_____
Signature of parent

If you wish, you may provide transportation for your child to and from the University yourself. If you are able to do so please indicate by signing your name below.

_____
Signature of parent

APPENDIX E

Developed by Ned A. Flanders, University of Minnesota, 1959. (see Flanders, Ned A. "Interaction Analysis in the Classroom: A Manual for Observers." Ann Arbor: University of Michigan, 1966, mimeographed.)

FLANDERS

OBSERVATION GUIDE

I. At the end of each 3 second interval, decide which category best represents the communication events just completed. Write down the category number. Assess the communication of the next interval and record. Maintain as steady a tempo as possible.

II. The observer record will be a sequence of numbers in a column, top to bottom. The sequence is, thus, preserved.

III. When there is a major change in class formation, communication pattern, or topic under discussion, draw a double line and indicate the time.

After a complete observation of a class, on the reverse side of the observation record form write a general description of each separate activity period indicated by double lines. Include: the nature of the activities, the class formation, and the position of the teacher. Note also any other observations which seem pertinent to interpretation.

DIRECTIVES FOR RECORDING VARIOUS CONTINGENCIES

I. When there is a choice of two or more acts in a 3 second time period, always record the act represented by the category most numerically distant from category 5, with the exception of category 10.

II. The observer is in the best position to judge whether the teacher is, in general, restricting or expanding pupil freedom or action. Remain alert to shifts in momentary patterns within the total social situation.

III. Distinctions between categories 3 and 5 rely upon observer judgment as to whether, a comment, (for instance, teacher repetition of pupil statements) is actually acceptance or merely verbal habit. Decision involves assessment of the total situation.

Habitual teacher responses, e.g., "Right" or "Good," should also be assessed to distinguish true praise (category 2). To be considered "Praise" assessment of whether or not such statements communicate reward or encouragement is required.

IV. Distinctions between categories 8 and 9. Example: Teacher asks questions. A group of hands go up. If a teacher calls on a pupil whose hand is not raised, his response is clearly 8. There is no simple ground rule when a pupil whose hand is raised is called upon.

Judgment is required. Example: Teacher dominated high speed drill-questions are more like 6 than 4; even when hands are raised, responses are 8.

When teacher lectures using periodic questions to assess pupil understanding the responses are 6 even when hands are raised. A rule of thumb question for deciding to classify as 9 is "How is the pupil showing his initiative?" Requiring a clear case of pupil initiative tends to decrease the number of tallies in category 9 and produces a better index to true initiative of pupil action.

V. Spontaneous pupil-to-pupil communications usually shown as a series of 9's. Insert a 10 to indicate when one student stops and another begins.

VI. When a teacher uses a question as criticism. (e.g., directed to an inattentive pupil or one who is whispering to another,) and it is recognized by the pupil as a call to attention, classify as 7.

VII. Some creative teachers utilize unique procedures which require the observer to infer the intent of the procedure rather than the event per se. Example: Teacher role plays a student faced with a problem which is anticipated, (record as 3. Humor injected into the portrayal, record as 2).

Observers are encouraged to discuss classification problems between full class observations.

FLANDERS' CATEGORIES FOR INTERACTION ANALYSIS[1]

TEACHER TALK	INDIRECT INFLUENCE	1. *ACCEPTS FEELING: accepts and clarifies the feeling tone of the students in a nonthreatening manner. Feelings may be positive or negative. Predicting or recalling feelings are included. 2. *PRAISES OR ENCOURAGES: Praises or encourages student action or behavior. Jokes that release tension, not at the expense of another individual, nodding head or saying, "um hm?" or "go on" are included. 3. *ACCEPTS OR USES IDEAS OF STUDENT: clarifying, building, or developing ideas or suggestions by a student. As teacher brings more of his own ideas into play, shift to category five. 4. *ASK QUESTIONS: asking questions about content or procedure with the intent that a student answer.
	DIRECT INFLUENCE	5. *LECTURING: giving facts or opinions about content or procedure; expressing his own ideas, asking rhetorical questions. 6. *GIVING DIRECTIONS: directions, commands, or orders to which a student is expected to comply. 7. *CRITICIZING OR JUSTIFYING AUTHORITY: statements intended to change student behavior from nonacceptable to acceptable pattern; bawling someone out; stating why the teacher is doing what he is doing; extreme self-reference.
	STUDENT TALK	8. *STUDENT TALK-RESPONSE: talk by students in response to teacher. Teacher initiates the contact or solicits student statement. 9. *STUDENT TALK-INITIATION: talk by students which they initiate. If "calling on" student is only to indicate who may talk next, observer must decide whether student wanted to talk. If he did, use this category.
		10. *SILENCE OR CONFUSION: pauses, short periods of silence and periods of confusion in which communication cannot be understood by the observer.

* There is NO scale implied by these numbers. Each number is classificatory; it designates a particular kind of communication event. To write these numbers down during observation is to enumerate, not to judge a position on a scale.

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[1]Developed by Ned A. Flanders, University of Minnesota, 1959.

APPENDIX F

COMPARISON OF CHANGES IN MEAN MTAI SCORES WITH FINDINGS FROM OTHER STUDIES

Data for comparison with data from this study was found in the following sources:

1. Cook, Walter W.; Carroll H. Leeds and Robert Callis. Minnesota Teacher Attitude Inventory Form A Manual. New York: The Psychological Corporation, 1951, pp. 8-9.

2. Sandgren, D. L. and L. G. Schmidt. "Does Practice Teaching Change Attitudes Toward Teaching?" Journal of Educational Research, 1956. Vol. 49, p. 676.

All subjects in the three studies compared below taught academic subjects in secondary schools and had received four years of training. There were males and females in all groups.

COMPARISON 1

Mean MTAI Scores From This Study and From Cook et al

This Study	Pretest	Posttest	Change	Cook et al	MTAI Mean Score
Group 1 (N=20)	42.95	45.15	+2.20	237 Seniors	67.8
Group 2 (N=20)	38.55	29.85	-8.70	264 Experienced teachers	24.7
				CHANGE	-43.1

COMPARISON 2

Mean MTAI Scores From This Study and From Sandgren and Schmidt

This Study	Pretest	Post-test	Change	Sandgren & Schmidt	Pretest	Post-test	Change
Group 1 (N=20)	42.95	45.15	+2.20	61 Student teachers	45.8	53.1	+7.3
Group 2 (N=20)	38.55	29.85	-8.70				

Differences in the origins of the data compared above limit the validity of generalization; however, if they are viewed within the framework of MTAI norms (which indicate that scores increase with

training and decrease with teaching experience), the following inference might be drawn: The experiences of traditionally supervised student teachers (Group 2) tend to be closer to real teaching situations than the experiences of student teachers studied by Sandgren and Schmidt; self-supervision may then be seen as a way to extend teacher training (as with Group 2) thereby postponing the decrease in scores for student teachers at Memphis State University.